

FIRE PREVENTION STANDARDS

Subject: Smoke Control

Number: xxx

Date: Revised 11/19/01

Page 1 of 4

OBJECTIVE

This standard has been developed to assist applicants, architects, mechanical engineers, contractors, general public, and Fire Prevention Personnel in designing, installing, and inspection of automatic smoke control devices in buildings. This standard will apply to the installation of new automatic devices for smoke control, or modifications to existing automatic smoke control devices installed under previous standards. This standard shall not apply to mechanical smoke management systems required by California Building Code Section 905.

All individuals and companies who propose to engage in the installation or alteration of smoke control devices are subject to the requirements of this standard.

PROCEDURE

I. Where Required

- A. Smoke control devices shall be installed as required by California Mechanical code Section 608. Air-moving systems supplying air in excess of 2,000 cubic feet per minute to enclosed spaces within buildings shall be equipped with automatic smoke controlled shut-off.
- B. Smoke control devices shall be installed as required by California Building Code Section 713.10 to cause the activation of smoke dampers.

II. Plan Submittal Requirements: Mechanical System Plans submitted for air-moving systems which require the installation of shut-down devices or smoke dampers installed in air ducts or fire resistive assemblies shall comply with the following:

- A. Mechanical system plans shall show the location of all air duct smoke detectors for air moving system shut-off. Plans shall show compliance with all items noted within Section III of this standard.
- B. Mechanical system plans shall show the location of all smoke dampers installed within air-moving systems or fire resistive assemblies. Plans shall show compliance with all items noted within Section IV of this standard.
- C. Mechanical system plans shall show the following note for installers: **“Smoke detectors installed within air-moving systems shall be fully tested to the satisfaction of the Sacramento County Fire Protection District. Acceptance testing shall conform to the requirements of Section V of SCFPD Fire Prevention Standard xxx.xxx Smoke Control.”**

III. Air Moving Shut-off Requirements: Air duct smoke detectors serving as shut-off devices for air-moving systems shall be designed and installed in accordance with the following:

- A. Smoke shut-off equipment shall be located in the main supply-air duct downstream of both the fan and the filters served by the equipment.
-

FIRE PREVENTION STANDARDS

Subject: Smoke Control**Number: xxx****Date: Revised 11/19/01****Page 2 of 4**

- B. Automatic shut-off shall be accomplished by interrupting the power source of the air-moving equipment upon detection of smoke in the main supply-air duct served by such equipment. Said power interruption shall occur within 5 seconds of smoke detector activation.
 - C. Air duct smoke detectors, which serve shut-off equipment, shall be listed by the California State Fire Marshal's Office for use within air-moving systems, and shall be installed in accordance with the manufacturer's installation instructions.
 - D. Air duct smoke detectors installed within air-moving systems shall be compatible with the operating velocities, pressures, temperatures and humidities of the system.
 - E. Air duct smoke detectors installed within air ducts shall be located between 6 and 10 duct equivalent diameters of straight, uninterrupted run to avoid smoke stratification.
 - F. Air duct smoke detectors shall be accessible for cleaning and shall be mounted in accordance with the manufacturer's instructions. Access doors or panels shall be provided in accordance with the current edition of National Fire Protection Association (NFPA) Standard 90A "Air Conditioning and Ventilation Systems", where said detectors are located above Gypsum Board or plaster interior ceilings.
 - G. All penetrations of an air supply duct in the vicinity of air duct smoke detectors shall be sealed to prevent entrance of outside air and possible dilution or redirections of smoke within the duct.
 - H. Where air duct smoke detectors serving air-moving systems are installed within concealed spaces, and /or drop ceiling areas, the detector shall be provided with a remote alarm LED device mounted on the ceiling tile directly below the unit served. Said remote alarm LED device shall be labeled to clearly identify the unit served (AC-1, FC-2, HVAC-3, etc...).
 - I. Where air duct smoke detectors serving air-moving systems are installed in concealed spaces, and/or drop ceiling areas, more than 10 feet above the finished floor, the detector shall be provided with a remote test and reset switch. Said remote test and reset switch shall be attached to an adjacent wall or structural column at a maximum height of 6 feet above finished floor.
 - J. Where a building is protected by a protective signaling system (fire alarm system) installed in accordance with the current edition of National Fire Protection Association Standard 72, "National Fire Alarm Code", the smoke detector required within air-moving systems shall be supervised by the system for trouble and supervisory alarm conditions. Upon activation of the smoke detector, a supervisory notification shall occur at the signal panel. No activation of alarm indicating devices (horns, strobes, and public address system) shall occur with the activation of an air-moving system smoke detector.
-

FIRE PREVENTION STANDARDS

Subject: Smoke Control**Number: xxx****Date: Revised 11/19/01****Page 3 of 4**

- K. Where smoke detectors required by this section are installed in a building not equipped with an approved protective signaling system (fire alarm system), an approved visual or audible notification device shall be provided in a normally occupied area served by the smoke detector. Approved signage shall be posted adjacent to the visual or audible notification device to indicate its purpose

IV. Smoke Damper Installation Requirements: Smoke detectors serving smoke dampers installed within buildings shall be designed and installed in accordance with the following:

- A. Air duct or area smoke detectors designed to cause the closure of smoke dampers shall be listed by the California State Fire Marshal's Office for such use.
- B. Air duct smoke detectors designed to cause the closure of smoke dampers shall be installed in accordance with the standards noted in Section III of this document.
- C. Air duct and area smoke detectors designed to cause the closure of smoke dampers shall be of a photoelectric type.
- D. Area smoke detectors shall be installed in accordance with the National Fire Alarm Code. Area smoke detector location and spacing shall be provided throughout the related smoke compartment.
- E. Air duct or area smoke detectors that are required to cause the closure of smoke dampers shall automatically stop their respective supply air fan(s) upon the detection of smoke.
- F. An approved service opening shall be provided to verify the closure of smoke dampers in accordance with California Building code Section 710.13. The opening shall be large enough to permit maintenance and resetting of the device.
- G. Where smoke detectors required by this section are installed in a building not equipped with an approved protective signaling system (fire alarm system), an approved visual or audible notification device shall be provided in a normally occupied area served by the smoke detector. Approved signage shall be posted adjacent to the visual or audible notification device to indicate its purpose.

V. Acceptance Testing: Smoke detectors shall have an acceptance test performed on them in accordance with the following in the presence of a Fire District Inspector:

- A. Air duct smoke detectors shall have a smoke entry air flow test performed on them to verify sufficient sampling of ducted air. A manometer or other approved device shall be provided at the site during the acceptance test to measure the differential pressure created from airflow across the sampling tubes. The differential pressure shall be within the parameters established by the manufacturer.
 - B. Air duct smoke detectors shall have an alarm test performed on them to verify air system shutdown. Where a protective signaling system (fire alarm) is provided, the alarm shall cause a supervisory notification on the signal control panel.
-

FIRE PREVENTION STANDARDS

Subject: Smoke Control

Number: xxx

Date: Revised 11/19/01

Page 4 of 4

- C. Trouble verification shall be demonstrated for all air duct smoke detectors interconnected with protective signaling systems (fire alarm).
- D. Remote test stations and alarm LED devices for air duct smoke detectors shall be fully tested.
- E. Area detectors installed within the smoke compartment shall be fully tested in accordance with the National Fire Alarm Code.
- F. Smoke detectors shall be tested with smoke in accordance with the manufacturer instructions. Magnet test is not a suitable test. The installing company shall provide canned smoke or smokeys for this test.

VI. Maintenance of Equipment: Smoke detectors shall be maintained in accordance with the following:

- A. Air duct smoke detectors shall have a functional test performed on an annual basis. Said test shall comply with the National Fire Alarm Code. Reports of said test shall be maintained by the building management and made available to the Fire Inspector upon request.
- B. Area detectors shall have a functional test performed on an annual basis. Said test shall comply with the National Fire Alarm Code. Reports of said test shall be maintained by the building management and made available to the Fire Inspector upon request.
- C. Detector sensitivity shall be checked within 1 year after installation and every alternate year thereafter. Detector sensitivity testing shall comply with the National Fire Alarm code. Detectors found to have sensitivity outside the listed and marked sensitivity range shall be cleaned and recalibrated in accordance with the manufacture's instructions or replaced.
- D. Smoke dampers shall have a full functional test performed on an annual basis. Said test shall comply with the current editions of NFPA 90A, "Air Conditioning and Ventilating Systems, Appendix B".
- E. Smoke detectors connected to a protective signaling system (fire alarm) shall be included in the contract for maintenance required at system plan submittal.

Mike Dobson, Fire Marshal
